uCertify

# Course Outline

## C# 9 and .NET 5 – Modern Cross-Platform Development - Fifth Edition




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1. Course Objective
2. Pre-Assessment
3. Exercises, Quizzes, Flashcards & Glossary

   Number of Questions
4. Expert Instructor-Led Training
5. ADA Compliant & JAWS Compatible Platform
6. State of the Art Educator Tools
7. Award Winning Learning Platform (LMS)
8. Chapter & Lessons

   Syllabus

   Chapter 1: Hello, C#! Welcome, .NET!

   Chapter 2: Speaking C#

   Chapter 3: Controlling Flow and Converting Types

   Chapter 4: Writing, Debugging, and Testing Functions

   Chapter 5: Building Your Own Types with Object-Oriented Programming

   Chapter 6: Implementing Interfaces and Inheriting Classes

   Chapter 7: Understanding and Packaging .NET Types

   Chapter 8: Working with Common .NET Types

   Chapter 9: Working with Files, Streams, and Serialization

   Chapter 10: Protecting Your Data and Applications

   Chapter 11: Working with Databases Using Entity Framework Core

   Chapter 12: Querying and Manipulating Data Using LINQ

   Chapter 13: Improving Performance and Scalability Using Multitasking

   Chapter 14: Introducing Practical Applications of C# and .NET

   Chapter 15: Building Websites Using ASP.NET Core Razor Pages

   Chapter 16: Building Websites Using the Model-View-Controller Pattern

   Chapter 17: Building Websites Using a Content Management System

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## 1. Course Objective

Learn C# programming skills with the C# 9 and .NET 5 – Modern Cross-Platform Development course and lab. The C# training course and lab provide skills required for performing tasks like managing and querying data, monitoring and improving performance, and working with the file system. The C# course comes with the best C# tutorial that provides hands-on expertise on the fundamentals of C#, including object-oriented programming and new C# 9 features.

## 2. Pre-Assessment

Pre-Assessment lets you identify the areas for improvement before you start your prep. It determines what students know about a topic before it is taught and identifies areas for improvement with question assessment before beginning the course.

## 3. Quizzes

Quizzes test your knowledge on the topics of the exam when you go through the course material. There is no limit to the number of times you can attempt it.




## 4. flashcards

Flashcards are effective memory-aiding tools that help you learn complex topics easily. The flashcard will help you in memorizing definitions, terminologies, key concepts, and more. There is no limit to the number of times learners can attempt these. Flashcards help master the key concepts.




## 5. Glossary of terms

uCertify provides detailed explanations of concepts relevant to the course through Glossary. It contains a list of frequently used terminologies along with its detailed explanation. Glossary defines the key terms.




## 6. Expert Instructor-Led Training

uCertify uses the content from the finest publishers and only the IT industry's finest instructors. They have a minimum of 15 years real-world experience and are subject matter experts in their fields. Unlike a live class, you can study at your own pace. This creates a personal learning experience and gives you all the benefit of hands-on training with the flexibility of doing it around your schedule 24/7.

## 7. ADA Compliant & JAWS Compatible Platform

uCertify course and labs are ADA (Americans with Disability Act) compliant. It is now more accessible to students with features such as:

- Change the font, size, and color of the content of the course
- Text-to-speech, reads the text into spoken words
- Interactive videos, how-tos videos come with transcripts and voice-over
- Interactive transcripts, each word is clickable. Students can clip a specific part of the video by clicking on a word or a portion of the text.

JAWS (Job Access with Speech) is a computer screen reader program for Microsoft Windows that reads the screen either with a text-to-speech output or by a Refreshable Braille display. Student can easily navigate uCertify course using JAWS shortcut keys.

## 8. State of the Art Educator Tools

uCertify knows the importance of instructors and provide tools to help them do their job effectively. Instructors are able to clone and customize course. Do ability grouping. Create sections. Design grade scale and grade formula. Create and schedule assessments. Educators can also move a student from self-paced to mentor-guided to instructor-led mode in three clicks.

## 9. Award Winning Learning Platform (LMS)

uCertify has developed an award winning, highly interactive yet simple to use platform. The SIIA CODiE Awards is the only peer-reviewed program to showcase business and education technology's finest products and services. Since 1986, thousands of products, services and solutions have been recognized for achieving excellence. uCertify has won CODiE awards consecutively for last 7 years:

- **2014**
    1. Best Postsecondary Learning Solution

- **2015**
    1. Best Education Solution

2. Best Virtual Learning Solution
3. Best Student Assessment Solution
4. Best Postsecondary Learning Solution
5. Best Career and Workforce Readiness Solution
6. Best Instructional Solution in Other Curriculum Areas
7. Best Corporate Learning/Workforce Development Solution

- **2016**
    1. Best Virtual Learning Solution
    2. Best Education Cloud-based Solution
    3. Best College and Career Readiness Solution
    4. Best Corporate / Workforce Learning Solution
    5. Best Postsecondary Learning Content Solution
    6. Best Postsecondary LMS or Learning Platform
    7. Best Learning Relationship Management Solution

- **2017**
    1. Best Overall Education Solution
    2. Best Student Assessment Solution
    3. Best Corporate/Workforce Learning Solution
    4. Best Higher Education LMS or Learning Platform

- **2018**
    1. Best Higher Education LMS or Learning Platform
    2. Best Instructional Solution in Other Curriculum Areas
    3. Best Learning Relationship Management Solution

- **2019**
    1. Best Virtual Learning Solution
    2. Best Content Authoring Development or Curation Solution
    3. Best Higher Education Learning Management Solution (LMS)

- **2020**

1. Best College and Career Readiness Solution
2. Best Cross-Curricular Solution
3. Best Virtual Learning Solution

## 10. Chapter & Lessons

uCertify brings these textbooks to life. It is full of interactive activities that keeps the learner engaged. uCertify brings all available learning resources for a topic in one place so that the learner can efficiently learn without going to multiple places. Challenge questions are also embedded in the chapters so learners can attempt those while they are learning about that particular topic. This helps them grasp the concepts better because they can go over it again right away which improves learning.

Learners can do Flashcards, Exercises, Quizzes and Labs related to each chapter. At the end of every lesson, uCertify courses guide the learners on the path they should follow.

## Syllabus

### Chapter 1: Hello, C#! Welcome, .NET!

- Setting up your development environment
- Understanding .NET
- Building console apps using Visual Studio Code
- Downloading solution code from the GitHub repository
- Looking for help
- Practicing and exploring
- Summary

## Chapter 2: Speaking C#

- Introducing C#
- Understanding C# basics
- Working with variables
- Working with null values
- Exploring console applications further
- Practicing and exploring
- Summary

## Chapter 3: Controlling Flow and Converting Types

- Operating on variables
- Understanding selection statements
- Understanding iteration statements
- Casting and converting between types
- Practicing and exploring
- Summary

## Chapter 4: Writing, Debugging, and Testing Functions

- Writing functions
- Debugging during development
- Logging during development and runtime
- Unit testing functions
- Practicing and exploring
- Summary

## Chapter 5: Building Your Own Types with Object-Oriented Programming

- Talking about object-oriented programming
- Building class libraries
- Storing data within fields
- Writing and calling methods
- Controlling access with properties and indexers
- Pattern matching with objects
- Working with records
- Practicing and exploring
- Summary

## Chapter 6: Implementing Interfaces and Inheriting Classes

- Setting up a class library and console application
- Simplifying methods
- Raising and handling events
- Implementing interfaces
- Making types safely reusable with generics
- Managing memory with reference and value types
- Inheriting from classes
- Casting within inheritance hierarchies
- Inheriting and extending .NET types
- Practicing and exploring
- Summary

## Chapter 7: Understanding and Packaging .NET Types

- Introducing .NET 5
- Understanding .NET components
- Publishing your applications for deployment
- Decompiling assemblies
- Packaging your libraries for NuGet distribution

- Porting from .NET Framework to .NET 5
- Practicing and exploring
- Summary

## Chapter 8: Working with Common .NET Types

- Working with numbers
- Working with text
- Pattern matching with regular expressions
- Storing multiple objects in collections
- Working with spans, indexes, and ranges
- Working with network resources
- Working with types and attributes
- Working with images
- Internationalizing your code
- Practicing and exploring
- Summary

## Chapter 9: Working with Files, Streams, and Serialization

- Managing the filesystem
- Reading and writing with streams
- Encoding and decoding text
- Serializing object graphs
- Practicing and exploring
- Summary

## Chapter 10: Protecting Your Data and Applications

- Understanding the vocabulary of protection
- Encrypting and decrypting data
- Hashing data
- Signing data
- Generating random numbers
- What's new in cryptography?
- Authenticating and authorizing users
- Practicing and exploring
- Summary

## Chapter 11: Working with Databases Using Entity Framework Core

- Understanding modern databases
- Setting up EF Core
- Defining EF Core models
- Querying EF Core models
- Loading patterns with EF Core
- Manipulating data with EF Core
- Practicing and exploring
- Summary

## Chapter 12: Querying and Manipulating Data Using LINQ

- Writing LINQ queries
- Working with sets and bags using LINQ
- Using LINQ with EF Core
- Sweetening LINQ syntax with syntactic sugar
- Using multiple threads with parallel LINQ
- Creating your own LINQ extension methods
- Working with LINQ to XML
- Practicing and exploring

- Summary

## Chapter 13: Improving Performance and Scalability Using Multitasking

- Understanding processes, threads, and tasks
- Monitoring performance and resource usage
- Running tasks asynchronously
- Synchronizing access to shared resources
- Understanding async and await
- Practicing and exploring
- Summary

## Chapter 14: Introducing Practical Applications of C# and .NET

- Understanding app models for C# and .NET
- New features in ASP.NET Core
- Understanding SignalR
- Understanding Blazor
- Understanding the bonus lessons
- Building an entity data model for Northwind

- Summary

## Chapter 15: Building Websites Using ASP.NET Core Razor Pages

- Understanding web development
- Understanding ASP.NET Core
- Exploring Razor Pages
- Using Entity Framework Core with ASP.NET Core
- Using Razor class libraries
- Configuring services and the HTTP request pipeline
- Practicing and exploring
- Summary

## Chapter 16: Building Websites Using the Model-View-Controller Pattern

- Setting up an ASP.NET Core MVC website
- Exploring an ASP.NET Core MVC website
- Customizing an ASP.NET Core MVC website
- Using other project templates
- Practicing and exploring
- Summary

## Chapter 17: Building Websites Using a Content Management System

- Understanding the benefits of a CMS
- Understanding Piranha CMS
- Defining components, content types, and templates
- Testing the Northwind CMS website
- Practicing and exploring
- Summary

## Chapter 18: Building and Consuming Web Services

- Building web services using the ASP.NET Core Web API
- Documenting and testing web services
- Consuming services using HTTP clients
- Implementing advanced features
- Understanding other communication technologies
- Practicing and exploring
- Summary

## Chapter 19: Building Intelligent Apps Using Machine Learning

- Understanding machine learning
- Understanding ML.NET
- Making product recommendations
- Practicing and exploring
- Summary

## Chapter 20: Building Web User Interfaces Using Blazor

- Understanding Blazor
- Building components using Blazor Server
- Building components using Blazor WebAssembly
- Practicing and exploring
- Summary

## Chapter 21: Building Cross-Platform Mobile Apps

- Understanding XAML
- Understanding Xamarin and Xamarin.Forms
- Building mobile apps using Xamarin.Forms
- Consuming a web service from a mobile app

- Practicing and exploring
- Summary

### Chapter 22: Appendix A: Building Windows Desktop Apps

- Understanding legacy Windows application platforms
- Migrating WPF apps to .NET 5
- Understanding the modern Windows platform
- Creating a modern Windows app
- Exploring common controls and acrylic brushes
- Exploring Reveal
- Using resources and templates
- Replacing a control template
- Using data binding
- Practicing and exploring
- Summary

## 11.  Practice Test

## Here's what you get

| 60 | 60 |
| --- | --- |
| PRE-ASSESSMENTS QUESTIONS | POST-ASSESSMENTS QUESTIONS |

## Features

Each question comes with detailed remediation explaining not only why an answer option is correct but also why it is incorrect.

### Unlimited Practice

Each test can be taken unlimited number of times until the learner feels they are prepared. Learner can review the test and read detailed remediation. Detailed test history is also available.

Each test set comes with learn, test and review modes. In learn mode, learners will attempt a question and will get immediate feedback and complete remediation as they move on to the next question. In test mode, learners can take a timed test simulating the actual exam conditions. In review mode, learners can read through one item at a time without attempting it.

## 12.  Live Labs

The benefits of live-labs are:

- Exam based practical tasks
- Real equipment, absolutely no simulations
- Access to the latest industry technologies
- Available anytime, anywhere on any device
- Break and Reset functionality
- No hardware costs

# Lab Tasks

**Hello, C#! Welcome, .NET!**

- Creating a Simple Console Application
- Getting Definitions of Data Types
- Getting Help for the dotnet Tool

**Speaking C#**

- Using Variables
- Using the sizeof() Operator
- Comparing Decimal and Double Values
- Using the default() Operator
- Using Interpolation of Strings
- Formatting Strings
- Getting Text Input From a User

**Controlling Flow and Converting Types**

- Using Operators
- Using the switch Statement
- Using the if else Statement
- Using the foreach Loop
- Using the for Loop
- Using the while Loop
- Using the do while Loop
- Using Error Handling
- Implementing the Explicit Type Conversion
- Implementing the Implicit Type Conversion

**Writing, Debugging, and Testing Functions**

- Using Recursion
- Using the return Keyword
- Creating a Function
- Logging in C#

**Building Your Own Types with Object-Oriented Programming**

- Creating a Class
- Creating an Object
- Using Access Modifiers
- Defining Fields in a Class
- Using Properties
- Using enum
- Using Constructors
- Using Methods in a Class
- Using Tuples
- Using Records

**Implementing Interfaces and Inheriting Classes**

- Using Events
- Using a Static Delegate
- Using Instance Delegates
- Creating an Abstract Class
- Using Polymorphism
- Using Encapsulation

**Understanding and Packaging .NET Types**

- Publishing a Console Application

**Working with Common .NET Types**

- Checking the Content of a String
- Splitting a String
- Using Regular Expressions

- Using Dictionaries
- Using Lists

**Working with Files, Streams, and Serialization**

- Managing File Paths
- Using a StreamWriter Class
- Using StreamReader
- Using the BinaryWriter Class
- Using Serialization

**Protecting Your Data and Applications**

- Implementing AES Encryption

**Working with Databases Using Entity Framework Core**

- Managing a Database with SQLiteStudio
- Setting up the dotnet-ef Tool
- Connecting to a Database in Visual Studio

**Querying and Manipulating Data Using LINQ**

- Using LINQ Queries
- Using the LINQ OrderBy Operator
- Using the UNION Operator
- Using LINQ to XML

**Improving Performance and Scalability Using Multitasking**

- Applying a Mutually Exclusive Lock
- Using the Thread.Sleep Method

**Building Websites Using ASP.NET Core Razor Pages**

- Finding a List and Configuring a Windows Service

**Building Websites Using the Model-View-Controller Pattern**

- Creating a Link

**Building and Consuming Web Services**

- Creating a Web Service

**Building Web User Interfaces Using Blazor**

- Using Blazor

## Here's what you get

| 65 | 65 | 01:30 |
|---|---|---|
| LIVE LABS | VIDEO TUTORIALS | HOURS |

## 13. Post-Assessment

After completion of the uCertify course Post-Assessments are given to students and often used in conjunction with a Pre-Assessment to measure their achievement and the effectiveness of the exam.

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